

as private persons. But there is one gentleman, with whom, from his position as Editor of 'The Ibis,' this excuse would not be valid; and therefore in exceptionally particularizing Mr. P. L. Selater as one of those to whom whatever merit there may be in this paper is largely due, we offer our best thanks equally to our unnamed friends, especially those resident in that island for whose prosperity we most fervently wish.

XXXVI.—*On the occurrence of White's Thrush (Oreocincla aurea) near Stratford-on-Avon, with remarks on the genera Oreocincla, Turdus, and Merula.* By ROBERT F. TOMES.

THE opportunity of examining a recently-killed specimen of the *Turdus aureus* of M. Hollandre (*T. Whitii* of Yarrell's 'British Birds'), occurs so rarely, that on the receipt of a recently-shot specimen, I thought it desirable to make an examination of it at once, before it had undergone mutilation of any of its parts in the process of preservation. Afterwards I examined with care the digestive organs, and the form and proportion of its sternum and other bones. The record of these peculiarities, with the addition of some remarks which I am able to give relative to its habits, will, I believe, render the following description more complete than any one which has yet appeared. When examining the osteology, I had occasion to make a comparative use of the skeleton of some other of our British Thrushes, and shall take the present opportunity of adding a few comments on the value of some of the divisions into which the genus *Turdus* has been divided.

I may commence by stating that the village of Welford, five miles west of Stratford-on-Avon, where the specimen was obtained, is situated in a bend of the Avon, and that the soil is a rich alluvium. Its position is highly favourable for the growth of timber and fruit trees; and it is well shrouded in orchards and small enclosures, fringed with their hedge-rows and ivied elms, affording a favourite haunt for many of the smaller birds, with a good supply of cherries and other fruits in the summer months, and of berries through the autumn and winter seasons. From a cherry orchard, a few miles down stream, I

obtained, a few years since, a specimen of the Rose-coloured Pastor ; and Starlings and Thrushes abound. Of insect-feeders there is an equally good supply ; and I have had more than one opportunity of inspecting the nesting of the lesser Spotted Woodpecker.

In a small grass inclosure immediately adjoining the village, and thickly surrounded by elms, a friend of mine observed a bird rise from a dry leafy ditch, which at the first glance was mistaken for a Woodcock, but soon recognized as one of the Thrush kind. This happened on the 6th of January ; and on hearing the account, I stimulated further search, but without effect until the 23rd of that month, when the bird was again flushed from the same inclosure, and, as before, from the bottom of a dry ditch amongst dead leaves. Again on the 26th it rose from the same ditch, and within a few yards of the same spot. On each occasion it was busied in turning over the dead leaves, from beneath which it appears to have taken its food. Although Blackbirds, Thrushes, and Missel-thrushes were abundant and seen at the same time feeding on the ivy and hawthorn berries, the present bird was always observed to resort only to the trees or hedges when disturbed, and then merely as a place of rest, remaining for some time perched in an upright position in one spot, without noticing the berries or the species feeding on them. Its flight when roused from its feeding was very undulating, like that of the Green Woodpecker, and low, often settling on the ground, and only making choice of a tree when it happened to pass under one, into which it rose almost vertically. As far as its habits could be ascertained from these short opportunities of observation, it would appear to be almost entirely a ground feeder. Mr. Blyth says of the allied Indian species, *Oreocincla dauma*, that it is generally met with amongst bamboos, in which situation the ground would very likely be the attraction, rather than the canes.

I have been thus particular in the description of the locality in which the bird appeared, on account of the interval which occurred between its first and second appearance ; for it must be supposed that it was a suitable one, or it would not have again returned to it after an absence of more than a fortnight.

An examination of the specimen when obtained gave the following results.

The tail-feathers are *fourteen* in number; the two central ones the shortest, the next pair of nearly equal length with the outer pair, and the remaining ones, viz. four on each side, nearly equal in length and the longest. The outer one has its root dusky, more extended on the inner than on the outer web: middle part greyish, tinged with yellow; the tip white, less distinct on the outer than on the inner web. Second feather similar but darker, and less grey, with the dusky part almost black, and reaching to two-thirds of its length. Third one with the dark part extended almost to the white tip, leaving only a small space of yellow-brown on the outer web, but having some of that colour at the root on that web. Fourth with the same patch of yellowish at the base, but reaching for more than half its length; whilst that which was reduced to a small space on the third near its tip, is in this one quite lost. Fifth, similar to the fourth, but the yellow-brown extended to fully three-fourths of its length. Six and seventh wholly yellow-brown, faintly barred on both webs with darker brown. All the white tips decreasing in size from the outer to the inner feathers, on which they are almost obsolete*.

First quill short and rudimentary. Of those which really compose the end of the wing, the first and fourth are nearly equal, and the second and third also nearly equal in length and the longest in the wing—longer by four or five lines than the first and fourth. The wing, in its structure, does not differ much from that of the Fieldfare, Song-thrush, Ring-ousel, or Missel-thrush, the relative length of the quills being pretty similar. Closed wings with their ends extending to within two inches of the end of the tail.

Irides very dark brown, almost black. Upper mandible uniform dark brown; lower one similar, but yellowish towards and at the base. Legs and feet pale yellowish-brown; claws the same, but paler. Weight $93\frac{2}{3}$ drachms.

* The late Prince C. L. Bonaparte, in his monograph of the genus *Oreocincla*, distinguishes this species from all the others thus:—"Cauda rectricibus 14, *variegata*."

	"	'''
Length from point of bill to end of tail . . .	12	2
„ of tail	4	5
„ of bill, along the ridge	0	10
„ of bill, gape line	1	3
„ of wing from carpal joint, following its anterior curve	7	3
„ of tarsus	1	5
„ of middle toe and claw	1	4
„ of hind toe and claw	1	2
Expanse of wings	20	6

The digestive organs differ somewhat from those of such of our British Thrushes as I have been able to make comparison with, in being strictly adapted to an insectivorous diet. The tongue, tapering to a smooth cleft point, is somewhat horny, and rather distinctly serrated on its upper surface near the root. Œsophagus of moderate length, without crop or dilatation, but rather wide; proventriculus moderately well developed, much more so than in the Blackbird, relatively much as in the Song-thrush. Stomach membranous, indicative of a more insectivorous regimen than the Blackbird; of small size, scarcely exceeding in this particular that of the much smaller Song-thrush; irregularly oblong, its greatest diameter being at right angles to a line between the two orifices. Intestine rather short in relation to the size of the bird, only exceeding that of the Blackbird by three or four inches, whilst in the bulk of the two birds there is manifestly a much greater difference than this. It is of medium size, and decreases evenly to the cæca. The latter are much more distinct than in the Blackbird, but somewhat like those of the Song-thrush. Cloaca large.

The following are the dimensions of these parts :—

	"	'''
Length of the œsophagus	4	3
Breadth of do.	0	4
Length of the proventriculus	0	8
„ between the two orifices of the stomach	0	4
„ of the stomach measured at right angles to the last dimension . . .	0	10
„ of the intestine	21	0

Greatest breadth of the intestine	"	'''
Length of the cæca	0	3
„ of the cloaca	0	4
Breadth of do.	1	4
	0	6

For the synonymy of this species, I refer the reader to the late Prince C. L. Bonaparte's Monograph of the genus *Oreocincla* in the 'Revue et Magasin de Zoologie,' No. 5, 1857. The presence of fourteen feathers in the tail, determines the species.

Without having gone into the subject with sufficient care to give a decided opinion, it has always appeared to me that the genera into which many families of birds have been divided are based upon a series of very minute differences of a purely external nature, without sufficient care having been first exercised in endeavouring to ascertain how far they may be referable only to the peculiar habits of the species. Assuming, by way of argument, that such has in some instances been the case, it must be pretty clear that the value of such divisions will depend almost entirely on the number of species contained in each. For instance, were we to take any genus of birds as given by the older writers, we should find it to consist of an assemblage having considerable diversity in the details of external parts; but perhaps the difference might be so slight that we should hesitate before dividing it into a series of new genera. A considerable number of the species would possibly be possessed of absolutely the same characters, differing only in such as we should not hesitate to name as purely specific. From the others these might differ in an inconsiderable but constant manner; but their separation would in this case be a very proper one: whether of generic or subgeneric rank would not affect the question. Clearly the differences, however minute, could not be regarded as specific; and in this manner a character, of apparently small value in itself, might become highly serviceable as a means of classification. Indeed its constancy might outweigh a peculiarity of more marked aspect when of limited occurrence, since it might be difficult in this case to determine what were specific, and what generic characters. No such difficulty could occur in the former of these supposed instances.

Having proceeded with this method as far as practicable, the remainder would have to be considered. Amongst such remainder will be found species differing too much from each other to be with consistency grouped together, but which nevertheless are not strongly marked enough to induce us to make a new genus for each one. But we are compelled either to do this, or place them all together—the constancy of the characters not being here determinable.

Such has been pretty much the case amongst the limited number of *Turdidæ* which I have had for comparison. I have now before me the following species—*Turdus musicus*, *T. iliacus*, *T. obscurus*, Gm., *T. pilaris*, *T. viscivorus*, *T. torquatus*, *T. cyaneus*, *T. merula*, *T. migratorius*, *T. mustelinus*, and a few other species, besides *Oreocincla dauma*, *O. aurea*, and *O. lunulata*. From these I select the first three, their general similarity being so great, even to the distribution of the colours and the markings of the feathers, that the most determined genus-maker would scarcely attempt to sever them. But on comparing the Song-thrush and Redwing, I find, besides the discrepancy in size, a greater relative length of wing in the latter than in the former. I shall proceed to analyse the value of this difference, as a means of arrangement of the two species.

The wing itself is structurally similar in both of them; that is, it has the same relative length of those feathers which constitute the end of the wing, but they are somewhat longer in relation to the secondaries and tertiaries in the Redwings. This difference in the length of the wing, indicative of greater or less powers of flight, is explained by the migratory and resident habits of the species; and on examining those internal parts which are instrumental in flight, we find that, although the migratory species is the smaller of the two, and has a sternum proportional to its size, the keel is fully as deep as in the larger and resident species: *relatively*, therefore, it is deeper. This is just as it should be: the longer wing necessary for the performance of specific migratory habits requires a greater development of muscle to wield it; and this is accomplished by the greater depth of the keel. This peculiarity is a purely *adaptive* one; there is no indication of an *essential* character in

this, the only recordable difference in the osteology of these species*.

A comparison may now be made between the Blackbird and Fieldfare, two species of somewhat similar size, one resident and the other migratory, as before, and, in like manner, characterized respectively by shortish and rounded wings, and by longer and more pointed ones. We feel quite prepared for results similar to those observed in the two preceding species, and are quite satisfied with finding that the sternal keel of the Blackbird is shallow as compared with that of the Fieldfare. But here the

* The intimate connexion which must needs exist between the external and internal parts of the organ of flight, involves another question of consideration to the scientific naturalist. I allude to the influence of external causes. As all the feathers of a bird, including of course those used in flight, are simply a development of the cutaneous system, it follows that, if any particular conditions of existence affect that system, they must affect also the internal parts with which it is immediately connected. However, we have yet to learn in what manner the plumage of birds is affected by external causes. The clothing feathers may be liable to modification quite apart from those which serve for locomotion; and this supposition (for I only advance it as such) has its analogy in the class Mammalia. The different species of *Tupaia* have fur of precisely the same quality and texture, and even colour, as some of the Squirrels of the same region; and the similarity is, as it seems but fair to suppose, due to their existence under similar external conditions. But the claws of these animals suffer no equalizing modifications; and they also are a part of the cutaneous system. It would be highly interesting to ascertain what part of the plumage of birds answers exactly to those parts of the cutaneous system of mammals which are developed into horny appendages subservient to locomotion and other uses. The claw of a tiger has as exact a relation to the whole of the limb on which it is fixed, and acts as perfectly with it as does the hoof of a horse with the limb to which it is affixed; but the hair which clothes the limb would seem in either case not necessarily to hold any direct or immediate relationship with the type on which the limb is constructed. The legs of the Tiger and Horse would perform their functions equally well if wholly deprived of hair, or if an exchange were made of it; but if deprived of claw and hoof, or an exchange made of them, very different results would accrue. If analogy be of avail in such cases, the same ought to hold good with birds, and we should be able to separate correctly the clothing plumage from that which serves for locomotion. This might furnish an argument for those who deem that everything necessary for the study of ornithology may be found in dry skin and feathers, since the native and special use of the limb should be understood by the study of these.

coincidence ends ; these species do not any further represent the former ones : the sternum of the Fieldfare does indeed represent pretty accurately that of the Redwing ; but that of the Blackbird will not satisfactorily take the place of the Song-Thrush. The sternum of the Blackbird has its hinder margin much more deeply incised on either side than that of the Fieldfare or Song-thrush, or Redwing,—the notches entering into the body of the bone for half its length, whereas in the latter species they do not divide the bone for more than one-third of its length. Again, instead of the transverse and nearly straight outline which this margin of the bone assumes in the species just referred to, we have in the Blackbird a distinctly rounded outline—the two lateral processes which are separated by the notch being a quarter of an inch shorter than the centre where the keel merges into that margin.

On comparing the sternum of *Oreocinclla aurea* with those of the foregoing species, I meet with characters which are common to several of them. The keel is deep, as in the migratory species ; and its depth, as in them, is proportional to the length of wing. In accordance with this indication of its powers of flight, are the strength of all the bones therewith connected. Thus the ribs are rather broad, and have their hind processes considerably developed, well united to the rib from which they spring, and lying firmly upon the one over which they pass. The scapular and clavicular bones also are strong, and firmly set, and well marked with seams and ridges for the attachment of muscles ; and the sternum itself has similar impressions. The costal process is divided from the body of the bone by a more prominent ridge than is usual in the *Turdidæ*, which first assists in forming a support for the foot of the coracoid bone, and then, extending in a backward direction, divides where it meets the the notch in the hinder margin of the sternum, and, proceeding backward on each side of that notch, assists at the same time in giving strength to that part of the bone, and supplying a suitable surface for the attachment of the muscles used in flight.

Notwithstanding the strength of these parts of the skeleton, the hinder part of the sternum itself exhibits a low degree of development. As in the Blackbird, that margin is rounded, and

even more so than in that species. The lateral notches enter into the bone for half its length, and are proportionally broad; while the side processes are so short that their outer angle reaches scarcely further in a forward direction than two-thirds of the entire length of the sternum, taken along the line of the keel.

Wishing, if possible, to ascertain more exactly the importance of this character, and knowing that the adult plumage of *Oreocincla* represents the immature plumage of some of the more typical Thrushes, I obtained for examination some of the latter when in that stage of plumage which most nearly resembles that of the *Oreocincla*. The results were satisfactory. I select as an example the Missel-thrush. In a mature bird the hinder margin of the sternum is transverse and but slightly rounded,—the notches on either side being of moderate size, and almost closed posteriorly. In a young bird, full-grown but retaining the spotted nesting-plumage, the hinder margin of the sternum is more rounded, and its lateral incisions are deep and open—in a word, very much like that part of the sternum of the *Oreocincla aurea*. The same differences in the sternum at different ages obtain also in the Ring-ousel, probably also in many other species.

Through the great kindness of Mr. Alfred Newton I am enabled to add a few notes on the sternum of some other *Turdidæ* :—

1. *Turdus migratorius*.—Form typical, sternum indicating a state of development similar to those of the Fieldfare and Ring-ousel.

2. *T. fuscatus*, Vieill. West Indies.—Two sterna of this species, sent by Mr. Newton, differ somewhat in the size and openness of the notch in the hinder part, but in both they are of moderate size. In one they are very like those in the sternum of the adult Missel-thrush; but in the other they are so much closed posteriorly as to present the appearance of two oval foramina. In general outline, too, the sternum of this species and the Missel-thrush bear considerable resemblance to each other.

3. *Monticola cyanea*.—The first thing noticeable in the sternum of this species is its small size compared with that of the Redwing

(whereas the wings of the two species are very nearly equal), the shallowness of its keel, and its greater solidity. Its hinder margin is not more rounded than that of the Song-thrush or Redwing, and it is much less broken by incisions, these being of comparatively small size, and almost closed posteriorly. It would not be difficult to regard this species as one of a high degree of development amongst the *Turdidæ*, but adapted to some special mode of life.

Of the sternum of two other species kindly forwarded by Mr. Newton, I refrain to speak. One of them, *Ixos obscurus*, is but remotely related to the genus *Turdus*; and the other, *Ixos xanthopygius*, I should also suppose, from the inspection of the sternum, to be of equally distant relationship. I have not examined a specimen of the latter species.

The modification in the form of the sternum of the species mentioned in this paper may be formally expressed in the following manner:—

* *Outward form typical.*

1. Sternum with the hinder margin nearly straight; lateral incisions nearly or quite closed posteriorly.

Ex. *Turdus viscivorus*, *T. fuscatus*, *Monticola cyanea*.

2. Sternum with the hinder margin moderately straight; lateral notches rather deeper, not closed posteriorly.

A. Organs of flight adapted for migratory habits.

Ex. *Turdus iliacus*, *T. pilaris*, *T. torquatus*, *T. migratorius*,
T. obscurus.

B. Organs of flight not adapted for migration.

Ex. *Turdus musicus*.

** *Outward form subtypical.*

1. Sternum with the hinder margin rounded, deeply notched, and exhibiting a degree of development in the adult similar to that of the immature of the foregoing and more typical group.

A. Organs of flight adapted for migratory habits.

Ex. *Oreocincla aurea*.

B. Organs of flight not adapted for migration.

Ex. *Turdus merula*.

It remains for further and more extended examination to show us with what external characters these various modifications of the sternum accord, and with what degree of constancy. The foregoing investigations, however, lead us to the conclusion that any considerable difference in external characters is accompanied with some modification or other in the form of the sternum.

And now I can readily fancy that, if any of the readers of this Magazine have taken the trouble to follow me to this point, they will be rather likely to exclaim, "Why all this about a Blackbird and a Thrush? for it is of them that chief mention is made, and it could scarcely be worth while to take up so much space about such very common species: surely we did not want to hear so much about them." Let me assure them that they are mistaken. If they are genuine zoologists they *do* want to hear all this and a great deal more, but in a more extended and better digested form than I have been able to give it, and with a more general knowledge of the method of working it out than I possess.

In order to arrive at a definite and truthful conclusion in a question like the one I have here propounded, it is absolutely necessary that we go through a great amount of laborious and minute comparison of part with part of many species before we can safely generalize; and the commonest species will furnish materials of value quite equal to what we can obtain of the rarer ones, with this striking advantage—that we can readily multiply our opportunities of investigation, and thereby prune away errors that are sure to find their way into restricted labours, even of the most watchful. And, besides, the commoner the species, the easier it is for every one to corroborate or refute what has been advanced.

XXXVII.—*List of Birds of Prey received from Beyrout.*

By JOHN HENRY GURNEY, M.P., F.Z.S.

THE following is a list of Birds of prey, of which specimens collected in Syria have recently been sent to me by Mr. Louis Laurretta of Beyrout. I may, perhaps, be allowed to add that